

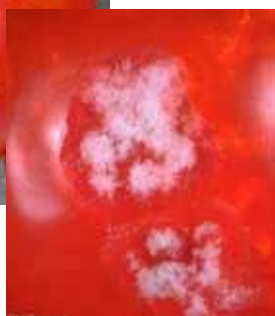
## Insect/Disease Information

### VEGETABLES

#### Cloudy Spot of Tomato



Missouri Botanical Garden



UC Statewide IPM Program

Cloudy spot on tomato fruits is most common in home gardens, and is characterized by pale yellow to white, somewhat spongy lesions on the fruit surface that are white in color just under the cut skin (shown at right). They are caused by yeasts or other toxins introduced into the fruit during the feeding by stink bugs. The discolored area and damaged tissue is superficial, and can be cut away to leave a still-edible tomato.



University of Georgia CAES

This type of damage is most noticeable in early to mid-August, when feeding by stink bugs increases in the garden. Look for them by vigorously shaking the plant and examining the dirt beneath for the fallen insects. One stinkbug per plant could cause about 5-10% damage.

Unfortunately, this insect is difficult to control because they prefer weedy areas such as fence rows and ditches, and are very mobile. If you opt for insecticide, cover vegetables thoroughly, as well as weedy areas.

**Treatment:** (**commercial**) lambda-cyhalothrin (Warrior), methomyl (Lannate), endosulfan (Thionex), cyfluthrin (Bay-

throid), imidacloprid (Admire); (**residential**) kaolin clay (Surround; organic; repels but does not kill), insecticidal soap (many; must be applied regularly), carbaryl (Sevin; up to 7 days before harvest)

#### Corn Earworm

We mentioned corn earworm in the July 18 advisory ([click here](#)). (This pest also feeds on tomato fruit, where it is referred to as tomato fruitworm.) Monitor ears for larval feeding by looking for chewed or missing silks and frass (excrement) at the tips of the ears.



Aside from the insecticides used for control, there are a few organic methods that can be used in small gardens:

- *Hand-pick caterpillars out from the ears.* Pull the husks back, remove the larva, and then use a twist-tie to secure the sheath back to its original position. Remember: once the silks are brown, they are not as attractive to egg-laying, so this only needs to be done once.
- *Use oil on silks at corn tips.* This is a control technique that dates back to the 1940s. The oil serves as a barrier to entering larvae, and also kills larvae already present at the tip. Research out of UMass suggests:
  - In a dropper-type container or spray bottle, prepare a solution of pure oil (corn, soybean, or mineral) mixed with *Bacillus thuringiensis* (Bt improves effectiveness, but OK to use oil alone) at the rate of 1 part Bt to 20 parts oil.
  - Use 0.5 mL per ear (5 drops from an eyedropper) directly to the silk at the tip of the ear. Oil can also be sprayed, but this technique is not as effective. Do not get oil on the husk or foliage.

## Insect/Disease Activity, continued

- Apply oil 2-4 days after silk is fully grown and pollination is almost complete (when the silk tips have begun to wilt and turn brown). Oil applied earlier will interfere with pollination, and oil applied later may result in more feeding damage. Only one application is necessary.

### Tarnished Plant Bug (lygus bug)



Tarnished plant bugs have been spotted on broccoli, beans, eggplant, tomato, and herbs in northern Utah. As nearby alfalfa fields are cut, these plant bugs move to alternative food sources. They mostly feed on flowers and fruit, but sometimes move to foliage, including lettuce.

Tarnished plant bugs feed with sucking mouthparts and their saliva is toxic to plants, killing the tissue at which it feeds. Examples of some damage:

- broccoli: dry, shriveled flower buds scattered across the head
- lettuce/cabbage: necrotic lesions along midrib that causes distorted leaves
- eggplant/pepper: feeding is limited to flowers, killing them
- tomato: feeding on fruit causes similar damage to stink bug injury; feeding on green fruit causes cat-facing (severe dimpling and distortion)
- potato: usually feed on leaves and flowers only, resulting in wilting, distorted, yellow leaflets and aborted flowers

Adults are very mobile and can move in and out of fields and between gardens rapidly, making monitoring and control difficult. As such, no chemical will give 100% control in vegetable gardens or fields. To suppress populations, remove overwintering sites such as thick weeds along field edges, and debris/brush piles.

*Treatment:* (**commercial**) permethrin (Pounce, Ambush), acetamiprid (Assail), bifenthrin (Capture, Brigade), carbaryl (Sevin), esfenvalerate (Asana), Lannate, Endosulfan, (**residential**) permethrin (Ace Multi-Purpose, Bayer Advanced, Bonide Eight, Spectracide Bug Stop), carbaryl (Sevin), Malathion, kaolin clay (Surround), pyrethrin (Pyganic)

### Tomato Curly Top Virus



R. Hammon, Colorado State University

Curly top is a disease of tomatoes caused by a virus that is vectored by the beet leafhopper. Symptoms include stunting, curled leaves, chlorosis, and fruit that becomes wrinkled and prematurely ripe. Young plants may be killed. Early symptoms resemble water stress; watering plants to look for recovery will aid in diagnosis. Other diagnostic symptoms are thickened leaves and purple leaf venation.

The virus persists in weed plants such as mustards and Russian thistle where the beet leafhopper prefers to feed. As weeds dry, the beet leafhopper moves to feed on tomato. Like the potato leafhopper, the beet leafhopper does not overwinter in northern Utah, and is blown north in storms and wind currents. Controlling the virus by controlling the leafhopper is difficult.

There is no cure for infected plants, and they should be removed. If the virus is a persistent problem, use resistant varieties. USU Extension agents, Rick Heflebower, Chad Reid, and Carolyn Washburn tested several tomato varieties in southern Utah bred for curly top resistance. They found that 'Roza' and 'Salad Master' showed excellent resistance to development of disease.

### Beet/Spinach Leafminer



Damage from leafminer was observed on beets in Utah County. Flies from the second generation will begin emerging

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## Insect/Disease Activity, continued

soon (mid-August) to lay eggs for the 3rd generation. There is both a beet (*Pegomya betae*) and spinach (*Pegomya hyoscyami*) leafminer, and both species feed on similar crops (beet, spinach, sugar beet, and Swiss chard) and have similar biologies.

The leafminer overwinters as a pupa in the soil, and emerges in May. White, oblong eggs are laid in neat rows on the undersides of leaves. Eggs are visible to the naked eye, and looking for them is a useful way to monitor activity during the season. The hatched maggot feeds between the upper and lower leaf epidermis, leaving behind a necrotic, serpentine trail. These mines eventually expand, forming large dead blotches on the leaves. A single maggot can cause significant damage, feeding on multiple leaves during its development. There are at least three generations per season.

Damage is mostly cosmetic, however with significant feeding early in the season, growth slows, and yields can be reduced due to a loss of photosynthetic surface.

Weed control is the first line of defense. Both species of leafminers also feed on lambsquarters, chickweed, nightshade, and *Amaranthus* species. Crop rotation and removing infested leaves can also help to reduce the population and damage. Row covers during egg-laying (mid-May, late June, mid-August) will protect plants.

Chemical control is not recommended unless leaves are to be used for consumption. (Homeowners, however, can cut away mined portions.) If used, chemicals are only effective when timed with egg deposition or hatching. Very few options are available (Malathion, Sevin).

## SMALL FRUITS

### Grape Leafhopper

Grape leafhopper is a sporadic pest in Utah, and damage and adult activity was observed in Utah County. The leafhopper first starts feeding in mid-spring on basal grape leaves and nearby weeds. There are several generations per season.

They feed on cell contents, leaving behind a distinctive stippled appearance to the leaves. When predators moderate population levels and damage is occurring to a few leaves only, economic losses do not occur, and control is not recommended.

At times, however, the leafhopper population can explode and cause the leaves to turn yellow, and to prematurely drop. This



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results in fruit sunburning and delays ripening. Small black drops of excrement mars the appearance of table grapes (shown above). In addition, plants may become stunted after repeated years of heavy feeding.

University of California reports that removing basal leaves and lateral shoots during berry set and for the following two weeks can reduce leafhopper populations by 30-50%. Diligent leaf removal may preclude the need for insecticides.

**Treatment:** (**commercial**) imidacloprid (Provado), acetamiprid (Assail), pyrethrin (Pyrenone), methomyl (Lannate), oil (**residential**) oil, insecticidal soap, kaolin clay (Surround), pyrethrin (Lilly Miller RTU, Pyganic), carbaryl (Bayer Advanced Complete), Malathion

**Precautionary Statement:** Utah State University Extension and its employees are not responsible for the use, misuse, or damage caused by application or misapplication of products or information mentioned in this document. All pesticides are labeled with ingredients, instructions, and risks. The pesticide applicator is legally responsible for proper use. USU makes no endorsement of the products listed herein.

### Small Fruits & Vegetables IPM Advisory

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